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<b>(21) International Application Number:</b> PCT/EP94/00920 <b>(22) International Filing Date:</b> 23 March 1994 (23.03.94) <b>(30) Priority Data:</b> 9307449.0      8 April 1993 (08.04.93)      GB <b>(71) Applicant (for AU BB CA GB IE LK MN MW NZ SD TT only):</b> UNILEVER PLC [GB/GB]; Unilever House, Blackfriars, London EC4P 4BQ (GB). <b>(71) Applicant (for all designated States except AU BB CA GB IE LK MN MW NZ SD TT US):</b> UNILEVER N.V. [NL/NL]; Weena 455, NL-3013 AL Rotterdam (NL). <b>(72) Inventor; and</b> <b>(75) Inventor/Applicant (for US only):</b> BENNER, Gerhard [DE/DE]; Bei den kleinen Hausen 10b, D-21643 Beckdorf (DE). <b>(74) Agent:</b> MULDER, C., W., R.; Unilever plc, Patent Division, Colworth House, Sharnbrook, Bedford MK44 1LQ (GB).		<b>(81) Designated States:</b> AT, AU, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, ES, FI, GB, GE, HU, JP, KG, KP, KR, KZ, LK, LU, LV, MD, MG, MN, MW, NL, NO, NZ, PL, PT, RO, RU, SD, SE, SI, SK, TJ, TT, UA, US, UZ, VN, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).  <b>Published</b> <i>With international search report.</i>
<b>(54) Title:</b> SURFACTANT COMPOSITION CONTAINING A SODIUM POLYOXYETHYLENE ALKYL ETHER SULFATE SURFAC- TANT AND A SULPHOSUCCINATE SURFACTANT  <b>(57) Abstract</b>  An aqueous surfactant composition suitable for topical application to the human skin comprising a sodium alkyl ether surfactant having from 0 to 5 ethylene oxide groups, and a sulphosuccinate surfactant. The composition is particularly suitable as a shampoo or shower gel base.		

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SURFACTANT COMPOSITION CONTAINING A SODIUM  
POLYOXYETHYLENE ALKYL ETHER SULFATE SURFACTANT  
AND A SULPHOSUCCINATE SURFACTANT

5        This invention relates to clear surfactant compositions.  
More particularly, it relates to clear surfactant  
compositions which may form the basis for personal  
cleansing compositions, such as shower gels.

10       Clear surfactant compositions are well known. For  
example, in GB1303810 (Unilever) there are described  
pourable liquid compositions for cleaning or rinsing  
which are clear. These compositions preferably comprise  
15       an anionic surfactant base, and preferably also a  
suspending agent such as a swelling clay or a soluble gum.  
They also comprise a visually distinct component of  
particle size at least 0.5mm in diameter, which is stably  
dispersed and suspended in the clear medium. The distinct  
20       component may comprise for example an emollient oil in the  
context of personal cleansing compositions. The distinct  
component is preferably encapsulated, or dispersed in a  
wax which breaks down during use.

25       Additionally, surfactant compositions are known as for  
example described in CA 968248, which comprise an aqueous  
liquid or gel detergent composition containing at least 1%  
by weight of an electrolyte and containing capsules which  
are otherwise stable, but which release their contents  
when the composition is diluted with water. Such capsules  
30       are suspended in the liquid or gel such that they do not  
lose their spacial arrangement during storage, i.e. they  
are "spatially stable". The capsules consist essentially  
of a water soluble polymeric wall material which is  
gellable to a continuous matrix, and either encapsulates a  
35       continuous core of liquid or solid, or forms a homogenous  
mixture with the core material.

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Surprisingly, we have found that it is possible, using a carefully selected combination of surfactants to provide a surprisingly clear, almost transparent surfactant composition which not only has excellent surfactant and aesthetic properties in its own right, but has also a sufficiently good rheological structure so as to be capable of supporting suspended particles. Such a surfactant composition may form an excellent base for any gel-like personal cleansing composition, for example a shower gel or a shampoo.

Thus, according to the invention, there is provided an aqueous surfactant composition suitable for topical application to the human skin, comprising a sodium alkyl ether sulphate surfactant having from 0 to 5 ethylene oxide groups, and a sulphosuccinate surfactant.

Preferably, the sodium alkyl ether sulphate surfactant is a sodium lauryl ether sulphate surfactant comprising an average of 2 to 4 ethylene oxide groups, in particular 3 ethylene oxide groups. Preferably the sodium alkyl ether surfactant is present in the composition at a level of 3-15% by weight.

According to a preferred aspect of the invention, the composition comprises from 5-35% by weight in total of surfactant, most preferably from 15-30% by weight of surfactant.

The sulphosuccinate surfactant used in compositions according to the invention may be any sulphosuccinate-containing surfactant entity. A preferred sulphosuccinate surfactant is Rewopol SBFA 30, ex Rewo, which is a 40% solution of disodium laurethsulphosuccinate. Preferably the composition comprises 3-10% by weight of the sulphosuccinate surfactant.

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In a strongly preferred embodiment of the invention, the composition is a shower gel or shampoo composition and comprises one or more thickening agents. A preferred combination of thickening agents in compositions according to the invention is a polysaccharide gum, in particular a xanthan gum, such as Keltrol (trademark), and a fatty acid glyceride polyglycol ether thickener, such as Rewoderm LIS 75 (ex Rewo).

10 Preferably, the total amount of thickening agents in the compositions according to the invention is of from 0.5 to 3% by weight, preferably 1 to 1.5% by weight.

15 It has also been found highly desirable to include in compositions according to the invention glycerin, at a level of from 1 to 12% by weight, more preferably 5 to 9.5% by weight. At these levels, the glycerin has been found to contribute to the clarity of the composition. The exact levels of glycerin employed in the composition, 20 may be readily adjusted by the skilled man to optimise clarity of the composition. Other agents that may be used in compositions according to the invention to promote clarity are 1,2-propanediol, and sorbitol.

25 According to a further preferred aspect of the invention, the composition additionally comprises a suspended phase. This is possible because the nature and viscosity of the composition is such that suspended particles of less than about 3mm diameter will remain suspended in a spatially 30 stable arrangement. The suspended phase may comprise solid particles such as high density mica (eg Timiron), and components of a high specific weight, or it may comprise liquid components which are retained in a solid matrix. The liquid components in the composition may be 35 for example emollients, oils, or other commonly used liquid benefit agents. The solid matrix for retaining the

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liquid component may be a homogenous mixture of liquid component and solid matrix material, or the liquid component may be encapsulated in the matrix material. The liquid component of the suspended phase may conveniently be delivered by rupturing of the capsules during use.

The suspended phase may be made by techniques known in the art, and may have as a solid matrix material, for example gelatin, or a wax, which may be for example impregnated with materials such as gum arabic. The suspended phase may conveniently contain a cosmetic material such as an oil; a preferred oil is advocado oil. Other preferred materials for incorporation in the suspended phase in compositions according to the invention include lipophilic materials, and also skin conditioning agents.

A preferred suspended phase has a particle diameter in the range 50-3000 $\mu$ m, more preferably 1700-2200 $\mu$ m.

It has been found that compositions according to the invention are superior to conventional similar compositions in that they not only provide excellent suspension of the suspended phase in the composition, but also they provide an excellent degree of transparency.

In a preferred embodiment of the invention in which the composition additionally comprises a suspended phase, the composition also comprises an emulsifier. Preferred emulsifiers according to the invention are PEG40 - hydrogenated castor oil emulsifiers, such as Cremophor RH40 or Cremophore RH410, ex. BASF. A further category of emulsifiers which may be used in compositions according to the invention are ethoxylated fatty acid derivatives. The purpose of this emulsifier is to prevent separation of the surfactant composition in the event that any oil escapes from the suspended phase.. Such an emulsifier may be

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present in the composition at a level of 0.1 to 5% by weight.

5 Compositions according to the invention may also comprise other components commonly found in such compositions, including for example salts, emollients, oils, buffers, perfumes, antioxidants, preservatives, or pigments.

10 Examples

The invention will now be illustrated with reference to the accompanying examples.

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Example 1

A shower gel was prepared according to the following composition.

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<u>Component</u>		<u>Formulation</u>
		<u>% w/w</u>
	Genapol ZRO (1)	14.5
25	REWOPOL SBFA 30PH (2)	13.3
	REWODERM LIS75 (3)	0.8
	KELTROL RD (4)	0.9
	Citric Acid	0.3
	Vitamin E Acetate (5)	0.1
30	Sodium Chloride	3.9
	Glycerin (6)	11.0
	CREMOPHOR RH40 (7)	0.5
	Microcapsules (8)	0.5
	Potassium Sorbate	0.5
35	Perfume	0.9
	Water	to 100

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- (1) A 69% w/w solution of sodium lauryl ether sulphate surfactant, ex Hoechst.
  - (2) A 40% solution of disodium laurethsulphosuccinate, containing Phenonip preservative, ex REWO.
  - (3) A PEG fatty acid glyceride thickener, ex REWO.
  - (4) Xanthan gum, ex KELCO.
  - (5) Ex BASF.
  - (6) 86% aqueous solution, ex Schrödinger/Unichema.
  - (7) PEG-40 derivative of hydrogenated castor oil, ex BASF.
  - (8) HC601, ex RAHN. The microcapsules comprise microencapsulated advocado oil and 2% Timiron Super Silver pigment, as a 60% slurry in water, encapsulated in gelatin/gum arabic, with Germaben II at 1% w/w in the aqueous phase as a preservative. Average particle diameter 2000µm.
- The composition of example 1 was made according to the following method.
- The Rewopol SBFA, Rewoderm LIS 75 and Genapol ZRO components are combined and heated to 60°C to dissolve the Rewoderm. To this warm solution is added the Keltrol, and subsequently 1% by weight of the sodium chloride to reduce any turbidity of the solution which arises after the Keltrol.
- The remaining components of the composition can then be introduced carefully with stirring into the warm solution.



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Finally, the viscosity of the composition can be modified by adjusting the amount of salt added to the composition, though the addition of too much salt can result in increased turbidity of the composition.

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Examples 2-9

Further compositions were prepared according to the method described in example one (all percentages are by weight of the composition). All provided shower gel formulations with a good degree of clarity and the ability to suspend microcapsules.

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Example	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>
SLES3EO (1)	14.5%	14.5%	14.5%	14.5%	14.5%	14.5%	14.5%	14.5%
REWOPOL SBFA PH(2)	13.3%	13.3%	13.3%	13.3%	13.3%	13.3%	13.3%	13.3%
REWODERM LIS 75 (3)	0.8%	0.5%	0.5	0.6	0.7	0.6	0.7	0.8
KELTROL RD (4)	0.6%	0.6%	0.6%	0.6%	0.8%	0.6%	0.8%	0.9%
Citric Acid	0.24%	0.27%	0.25%	0.25%	0.28%	0.25%	0.28%	0.26%
Vitamin E Acelate (5)	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
Sodium Chloride	4.4%	4.9%	4.9%	3.9%	3.7%	3.9%	3.7%	3.9%
Glycerin (6)	6.0%	-	-	1.5%	5.0%	1.5%	5.0%	11.0%
1,2 Propandiol	2.0%	2.0%	2.0%	1.0%	1.0%	1.0%	1.0%	-
CREMOPHOR RH40 (7)	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%
Micro-capsules (8)	-	0.5%	-	0.5%	0.5%	-	-	0.5%
Potassium Sorbate	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%
Perfume	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%
Water	to 100%	to 100%	to 100%	to 100%	to 100%	to 100%	to 100%	to 100%

(1)-(8) refer to the notes to the formulation in example 1.

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Comparative Examples

5        Examples of similar shower gel compositions to example 1 were made up, only containing as a surfactant mixture sodium lauryl ether sulphate (SLES) and cocoa amido propyl betaine as opposed to SLES and sulphosuccinate. Such comparative compositions were found to be less clear than those containing SLES and sulphosuccinate.

10       Comparative compositions were also made up containing the same surfactant system in example 1, and with as an alternative thickening agent Carbopol, as opposed to Keltrol. Whilst the Carbopol comparative example provided a sufficiently stable matrix for suspending the  
15       microspheres, the composition had inferior clarity compared to that having Keltrol as a thickening agent.

20       Further compositions were prepared in which the Rewoderm LIS is replaced by Rewopal PEG 6000DS (PEG-150 distearate). These compositions however, provided compositions with inferior viscosity properties.

25       Compositions according to the invention additionally have satisfactory storage properties.

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Claims

1. An aqueous surfactant composition suitable for topical application to the human skin comprising a sodium alkyl ether surfactant having from 0 to 5 ethylene oxide groups, and a sulphosuccinate surfactant.
2. A composition according to claim 1 wherein the sodium alkyl ether surfactant is present in the composition at a level of 3-15% by weight of the composition.
3. A composition according to claim 1 wherein the sodium alkyl ether surfactant is a sodium lauryl ether surfactant having an average of 3 ethylene oxide units.
4. A composition according to claim 1 wherein the sulphosuccinate surfactant is present at a level of from 3-10% by weight of the composition.
5. A composition according to claim 1, comprising a suspended phase.
6. A composition according to claim 1, comprising glycerin at a level of from 1 to 10% by weight of the composition.
7. A composition according to claim 1, comprising a mixture of thickening agents selected from the polysaccharide gums and fatty acid glyceride polyglycol ethers.
8. A composition according to claim 7 wherein the polysaccharide gum is xanthan gum.

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9. A composition according to claim 1, wherein the composition additionally comprises an emulsifier comprising a PEG 40-hydrogenated castor oil emulsifier and/or an ethoxylated fatty acid derivative emulsifier.
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10. A shampoo or shower gel composition suitable for topical application to the human skin comprising 3-15% by weight of a sodium lauryl ether surfactant having from 0 to 5 ethylene oxide groups, from 3-10% by weight of a sulphosuccinate surfactant, from 0.5 to 3% of a mixture of thickening agents comprising a polysacchoride gum and a fatty acid glyceride polyglycol ether thickener, from 1 to 10% by weight of glycerin and from 0.1 to 5% by weight of an emulsifier comprising a PEG40 hydrogenated castor oil emulsifier.
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## INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 94/00920

A. CLASSIFICATION OF SUBJECT MATTER  
IPC 5 A61K7/50

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 5 A61K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	EP,A,0 531 650 (GOLDWELL AG) 17 March 1993 see page 5; example 3 ---	1,7,9 7,8
Y	WO,A,92 17154 (THE PROCTER & GAMBLE COMPANY) 15 October 1992 see page 27; example 1 ---	7,8
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☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

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